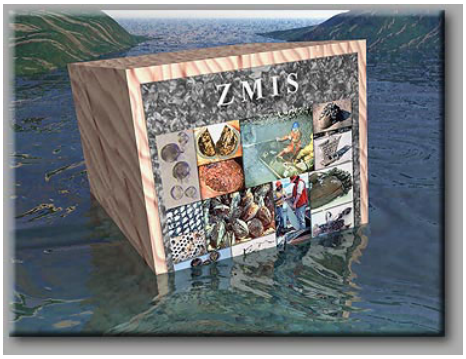
US Army Corps of Engineers®
Engineer Research and Development Center

Zebra Mussel Information System (ZMIS)

Technology



ZMIS is a computer-based information system designed to provide personnel involved in the management of zebra mussels with efficient and rapid access to a wide variety of information on zebra mussels. This includes information on the identification of adults and immatures, life history, impact, monitoring and detection, management strategies, contaminant issues, as well as an extensive bibliography. ZMIS is the product of over 5 years of programming and information gathering by the Corps of Engineers, the United States Department of Agriculture, the U.S. Department of the Interior, the National Biological Service, the New York State Museum, and Ontario Hydro. Much of the content in ZMIS is available to all users online at http://www.wes.army.mil/el/zebra/zmis/zmishelp.htm. ZMIS is also available as an interactive CD-ROM, which is available free of charge on a first-come, first serve basis from Dr. Michael J. Grodowitz, 601-634-2972, Michael.J.Grodowitz@erdc.usace.army.mil. The CD-ROM is a Windows®-based product and performs under Windows® 95 and higher versions only. ZMIS contains a variety of media types including hyper-linked text, photographic quality computer images, illustrations, and maps to aid users in understanding the problem and management of zebra mussels.

Problem

Since their introduction in 1986, zebra mussels have spread throughout the Great Lakes, the Mississippi River drainage basin, and threaten to extend their range to the river basins and water supply systems of the western states. The zebra mussel (*Dreissena polymorpha*) has become the most serious nonindigenous biofouling pest ever to be introduced into North American freshwater systems. It has the ability to tolerate a wide range of conditions and is extremely adaptable. It has the potential to significantly alter the ecosystem in any body of water it inhabits. To facilities that depend upon water intake, zebra mussel fouling can have a serious economic impact. Following are specific effects of zebra mussel fouling:

- Industrial and utility plants have experienced clogged or blocked intakes, and clogged or blocked distribution piping throughout the facilities.
- Plants have also experienced an increase in the corrosion of iron or steel piping and riveting, as well as the fouling of pumps, forebays, and holding tanks, trashracks, and condenser units.
- Water treatment facilities also have experienced fouling and loss of intake heads, obstruction of valves, corrosion of cast iron and steel piping, the putrid smell of decaying mussels, and buildup of methane gasses from the decaying mussel tissue.
- Boaters and recreational facilities have experienced the fouling of boat hulls and engines, heavy fouling of navigational buoys, which rendered many of them use-

less, the accumulation of windrows of mussel shells along beaches and shorelines, and the encrusting of docks and gear with colonizing mussels.

- Zebra mussels could render inoperable miter gates on locks, fire prevention systems, reservoir release structures, navigation dams, pumping stations, water-intake structures, dredges, and commercial and recreational vessels.

Expected Cost To Implement

The user incurs costs only in discretionary time spent using the system. ZMIS runs on computer setups that are readily available, i.e., IBM-compatible personal computer with Pentium processor and Microsoft Windows 95 and higher family with mouse support.

Benefits/Savings

ZMIS saves significant amounts of time, and therefore, dollars, since critical and important information is easily accessible in one location and can be accessed at the office, laboratory, and/or field locations. Content is interlinked and indexed so the user can reach specific information in a variety of ways. The organized format of ZMIS improves the quality of zebra mussel management activities and allows these activities to be accomplished more quickly and with greater ease. Many different personnel with different levels of training will benefit from ZMIS, including researchers, lock and dam operators, planning personnel, educators, local water authorities, etc.

Status

ZMIS will continue to provide new technology transfer items as part of the Aquatic Nuisance Species Research Program (ANSRP) and is being funded to maintain its currency and to add content to the online version.

ERDC POC

Dr. Michael J. Grodowitz, 601/634-2972, Michael.J.Grodowitz@erdc.usace.army.mil

Distribution Sources

ZMIS is available online to both Corps users and the public at http://www.wes.army.mil/el/zebra/zmis/zmishelp.htm. ZMIS is also available as an interactive CD-ROM, which can be obtained by sending an e-mail message from the online version or by contacting Dr. Michael J. Grodowitz, 601/634-2972, Michael.J.Grodowitz@erdc.usace.army.mil.

Available Documentation

Documentation on the content and operation of ZMIS is found within ZMIS.

Available Training

No training is necessary or offered (see **Available Support** below).

Available Support

ZMIS is a user-friendly computer-based decision support and information system. Guidance that accompanies ZMIS should make the system easy to use and navigate. However, if users experience problems in using ZMIS, they are asked to contact Dr. Michael Grodowitz (601-634-2972) or Sherry Whitaker (601-634-2990). For questions concerning the technical content of ZMIS, please contact Dr. Grodowitz.